Technical Specifications and Compliances

1 FIXED IP OUTDOOR CAMERA

The camera should be of high standards. The picture quality should be good & should be able to suit MP state environment. As many cameras will be installed at sensitive places for security of Vidhan sabha. it should be installed in such a way that they should be able to cover the areas which Security officers may want to view by all means and from anywhere.

While selecting camera bidder has to take care of all the aspects of the project Bandwidth requirement Storage space, quality of the video, Alarm generation & video analytics to be done at VMS level.

Specifications		**Complied (Yes/No)**
Image sensor & Minimum Effective Pixels (Resolution) or better	1/2.8" or better CMOS Progressive Scan & Minimum 2.5 MP or better	
Electronic Shutter	1/30 to 1 / 10,000 s or better	
Min illumination/ light sensitivity (Colour) or better	Minimum 0.4lux (30 IRE, F 1.2) or better	
Min illumination/ light sensitivity (B/W)	Minimum 0.02 lux (30 IRE, F 1.2) or better	
Wide Dynamic Range	Required	
Backlight Compensation	ON/OFF	
IRIS Control	DC or Automatic	
Focus	Automatic / Manual	
Automatic Gain Control	Auto / Manual	
Colour, Brightness, Contrast	functionality Required	
Frame Rate	25 FPS for 1920 x 1080 at H2.64 Compression or better	
Varifocal Lens	8– 50 /(3-9)mm varifocal lens or better Motorized Focal Zoom (MFZ)	
Video		
Day and Night functionality	Automatic, Color, Mono	
IR illuminator	***Illuminator may be Internal or external & visibility should be at least 30 m***	
Video Resolution	Minimum 2 MP (1920 x 1080)	
Video Streams	Individually configurable 02 video streams (H.264, MJPEG)	
Intelligent Video	Motion detection, Object Detection, Tampering Alert, Face Detection	
Compression		
Dual H.264 (Recording & Viewing)	Required	
Audio		

Audio support	Required	
Audio Compression	Minimum G.711 or better AAC48KHz or better	
Two-way audio	Required and should be audible.	
Input / Output	01 IN & 01 OUT	
Network & Interface		
Interface	RJ-45 for 10/100 base-T Ethernet	
Upgrade	Through web browser , online, firmware upgrade	
Network Protocols support	TCP/IP, HTTPS, , DHCP, UDP, DNS, SMTP, RTP, RTSP, SNMP, SSL protocols/Should meet all functional requirement of the project	
Alarm Event	Events / alerts send via FTP, HTTPS, email, Pre-Post alarm video buffering.. camera shall provide Camera Tamper Alarm and Motion detection as standard feature, Crowd detection	
Alarm I/O	1 potential Free 1 In & 1 Out	
Compliance	ONVIF 2 or better	
Security		
Password Protection	Required	
HTTPS encryption	Required	
IEEE 802.1X	Required	
IP address filtering	Required	
General		
Operational temperature °C	0°C to 60 °C	
Humidity	0 to 80% RH non-condensing	
IP rating	IP66/ NEMA 4X Rated Outdoor Housing with heater & Fan	
Power	PoE (Up to 15.4 Watt) OR eAC24V/ DC12V, 100- 230VAC	
Certifications	CE, UL, EN, FCC, ROHS	
Local Storage		
SD card	Camera shall be able to support SD card up to 32 GB. In the event of failure of connectivity to the central server the camera shall record video locally on the SD card automatically. After the connectivity is restored these recordings shall be automatically merged or can be merged manually as & when required with the server recording such that no manual intervention is required to transfer the SD card based recordings to server.	
Camera Applications	Camera shall have capability to run customised applications on the camera such as Audio Analytics, Video analytics. These applications shall be configurable and user shall have control on what applications can be run on a camera. These application changes shall not require any hardware changes in the camera.	

2 FIXED IP INDOOR CAMERA

Specifications		**Complied (Yes/No)**
Image sensor & Minimum Effective Pixels (Resolution) or better	1/2.8" or better CMOS Progressive Scan & Minimum 2.5 MP or better	
Electronic Shutter	1/30 to 1 / 10,000 s or better	
Min illumination/ light sensitivity (Colour) or better	Minimum 0.4lux (30 IRE, F 1.2) or better	
Min illumination/ light sensitivity (B/W)	Minimum 0.02 lux (30 IRE, F 1.2) or better	
Wide Dynamic Range	Required	
Backlight Compensation	ON/OFF	
IRIS Control	DC or Automatic	
Focus	Automatic / Manual	
Automatic Gain Control	Auto / Manual	
Colour, Brightness, Contrast	functionality Required	
Frame Rate	25 FPS for 1920 x 1080 at H2.64 Compression or better	
Varifocal Lens	8– 50 /(3-9)mm varifocal lens or better Motorized Focal Zoom (MFZ)	
Video		
Day and Night functionality	Automatic, Color, Mono	
IR illuminator	***Illuminator may be Internal or external & visibility should be at least 30 m***	
Video Resolution	Minimum 2 MP (1920 x 1080)	
Video Streams	Individually configurable 02 video streams (H.264, MJPEG)	
Intelligent Video	Motion detection, Object Detection, Tampering Alert, Face Detection	
Compression		
Dual H.264 (Recording & Viewing)	Required	
Audio		
Audio support	Required and should be audible.	
Audio Compression	Minimum G.711 or better AAC48KHz or better	
Two-way audio	Required	
Input / Output	01 IN & 01 OUT	
Network & Interface		
Interface	RJ-45 for 10/100 base-T Ethernet	
Upgrade	Through web browser , online, firmware upgrade	
Network Protocols support	TCP/IP, HTTPS, , DHCP, UDP, DNS, SMTP, RTP, RTSP, SNMP, SSL protocols/Should meet all functional requirement of the project	
Alarm Event	Events / alerts send via FTP, HTTPS, email, Pre-Post alarm video buffering.. camera shall provide Camera Tamper Alarm and Motion detection as standard feature, Crowd detection	
Alarm I/O	1 potential Free 1 In & 1 Out	

Compliance	ONVIF 2 or better	
Security		
Password Protection	Required	
HTTPS encryption	Required	
IEEE 802.1X	Required	
IP address filtering	Required	
General		
Operational temperature °C	0°C to 60 °C	
Humidity	0 to 80% RH non-condensing	
Power	PoE (Up to 15.4 Watt) OR eAC24V/ DC12V, 100- 230VAC	
Certifications	CE, UL, EN, FCC, ROHS	
Local Storage		
SD card	Camera shall be able to support SD card up to 32 GB. In the event of failure of connectivity to the central server the camera shall record video locally on the SD card automatically. After the connectivity is restored these recordings shall be automatically merged or can be merged manually as & when required with the server recording such that no manual intervention is required to transfer the SD card based recordings to server.	
Camera Applications	Camera shall have capability to run customised applications on the camera such as Audio Analytics, Video analytics. These applications shall be configurable and user shall have control on what applications can be run on a camera. These application changes shall not require any hardware changes in the camera.	

3 PTZ IP CAMERA

Specifications	
Image sensor & Minimum Effective Pixels (Resolution)	1 / 2.8”or better CMOS Progressive Scan minimum 2 MP
Focal Length	4.7 to 94mm
Zoom	20x Optical or better and 12 X digital Zoom
Electronic Shutter	1/30 to 1 / 10,000 s
Min illumination/ light sensitivity(Colour)	0.7 lux (30 IRE, F 1.6) or better
Min illumination/ light sensitivity (B/W)	0.1 lux (30 IRE, F 1.6) or better
Wide Dynamic Range	Required
Backlight Compensation	ON/OFF
IRIS Control	DC or Automatic
Focus	Automatic and Manual
Automatic Gain Control	Auto / Manual
Colour, Brightness, Contrast functionality	Required
Frame Rate	25 FPS for 1920 x 1080 or better
Video	
Day and Night functionality	Automatic, Colour, Mono Should automatically switch to night vision by sensing illumination level
Video Resolution	2 MP (1920 x 1080) or better
IR illuminator	External Illuminator & visibility should be at least 50 m
Video Streams	Individually configurable 02 video streams (H.264, MJPEG)
Intelligent Video	Motion detection
Electronic Image Stabilization	Required
PTZ Function	
PAN TILT Range	360° continuous pan & 180° tilt range
PAN TILT Speed	280° / sec for panning & 160° / sec for tilting
Presets	100 Preset Points
Tour & Pattern	Auto tour configurable scan
Privacy Mask	04 Zones
Compression	
MJPEG	Required
H.264	Required
Audio	
Audio support	Required
Audio Compression	G.711 or better
Two-way audio	Required
Input / Output	01 IN & 01 OUT
Network & Interface	
Interface	RJ-45 for 10/100 base-T Ethernet
Upgrade	Through web browser , online, firmware upgrade
Network Protocols support	TCP/IP, HTTPS, DHCP, UDP, DNS, SMTP, RTP, RTSP, SNMP, SSL protocols
Alarm Event	Events / alerts send via FTP, HTTPS, email, Pre-Post alarm video buffering.
Alarm	Tamper Alarm
Compliance	ONVIF 2.0 or higher

Security	
Password Protection	Required
HTTPS encryption	Required
IEEE 802.1X	Required
IP address filtering	Required
General	
Operational temperature °C	0°C to 55 °C
Humidity	0 to 80% RH non-condensing
IP rating	IP66 / NEMA 4X Rated Outdoor Housing **(Not required for Indoor Camers)**
Power	PoE (Up to 20W), AC/DC24V/ 100- 230VAC
Certifications	CE, UL, EN, FCC, ROHS
Local Storage	
SD card	Camera shall be able to support SD card up to 32 GB. In the event of failure of connectivity to the central server the camera shall record video locally on the SD card automatically. After the connectivity is restored these recordings shall be automatically merged with the server recording such that no manual intervention is required to transfer the SD card based recordings to server.

4 NETWORK SWITCHES

4.1 POE ACCESS SWITCH

These switches will be required for connecting cameras to the network.

Item	Minimum Required Specifications	Complied (Yes/no)
1	19" Rack Mountable stackable switch with min 24 Nos. 10/100/1000BaseT PoE ports and Min.2 Nos. free mini SFP/GBIC slot to accommodate 1000BaseSx/1000BaseLx Ports	
2	Switch should support for minimum 50 Gbps of throughout & 60 mbps forwarding rate	
3	The switch should have dedicated stacking port separate from uplink ports with 50 Gbps of stacking bandwidth.	
4	Shall support POE on all 24 # 10/100/1000 ports with support for external/internal redundant power supply	
5	The switch should have IPV4 & IPv6 support from day one	
6	Switch shall support IEEE 802.3ad Link Aggregation Control Protocol (LACP) with up to 8 links (ports) per trunk.	
7	It shall support IEEE 802.1s Multiple Spanning Tree Protocol and provide legacy support for IEEE 802.1d STP and IEEE 802.1w RSTP or equivalent technology and static routes.	
8	Switch should support minimum 8000 MAC address per switch	
9	Switch should have feature to protect access ports using port security, TACACS+, Radius, storm control, Access Control List both port , vlan based.	
10	Switch should support queuing as per IEEE 802.1P standard on all ports with mechanism for traffic shaping and rate limiting features for specified Host, network, Applications etc.	

4.2 L3 NETWORK SWITCH

S.no	Minimum required specifications	Complied (Yes/no)
1	Layer-3 Switch. 19" Rack Mountable with minimum 12 no of 10G SFP (SX based) & 12 no of 1GE ports. All ports should work on line rate.	
2	1+1 Redundant and hot swappable, load sharing Power supply & redundant FAN	
3	Two core switches will be connected in 100% redundancy with support for active/active configuration to avoid single point of failure in network.	
4	The Switch Should support at least 250 Gbps of switching capacity with 100 mbps of forwarding rate for both IPv4 & IPv6 from day one.	
5	The switch should support 48K IPv4 and IPv6 unicast routes, 15K multicast routes, 48K MAC address and 20k ACL	

6	The Switch Should support IEEE 802.1D Spanning Tree Protocol, IEEE 802.1w Rapid Reconfiguration of Spanning Tree, IEEE 802.1s Multiple VLAN Instances of Spanning Tree, IEEE 802.3ad LACP, IEEE 802.1p CoS Prioritization, IEEE 802.1Q VLAN, IEEE 802.1X User Authentication	
7	The Switch Should support MLD Snooping for IPv6 in hardware, Unicast Reverse Path Forwarding for IPv6 in hardware	
8	The Switch Should support Internet Group Management Protocol (IGMP) Snooping, IPv6 Multicast Listen Discovery (MLD), Multicast Listen Discovery snooping, IEEE 802.1AB LLDP	
9	The Switch should have OSPF, RIP, Policy-Based Routing, BGP enabled for both IPv4 & IPv6 from day one	
10	The Switch Should support Unicast Reverse Path Forwarding (Unicast RPF, support distributed and customized approach to event detection and recover, Dynamic Host Control Protocol server (DHCP)	
11	The switch should support IPv6 RA-Guard, DHCP-Guard, Source-Guard features and IPv6 fast-hop security	

4.3 FC-IP SWITCH (IF REQUIRED)

Sr.NO	Item Description --FC-IP Router /Switch	Compliance (Yes/No)
1	Minimum 18 port 2 / 4/8 /16 Gbps FC ports scalable to 36 FC ports with SFPs within the same switch with multiprotocol support for Fiber Channel (FC), FC over Ethernet (FCoE), FCIP, iSCSI,	
2	Two Fixed 1/10 Gbps Ethernet ports for FCIP and iSCSI connectivity to industry standard Ethernet switches/Routers	
3	Four Fixed 10 Gbps FCOE ports with SFPs connectivity to industry standard FCOE switches	
4	Remote SAN extension with high-performance FCIP (Fiber Channel over IP) for business continuance / DR Replication	
5	iSCSI router / Gateway capability to extend SAN storage with block access to Ethernet-attached servers.	
6	Should support backup, remote replication, and other disaster-recovery services over WAN distances using open-standards FCIP	
7	Should have hardware-based compression, hardware-based encryption, FCIP write acceleration, and FCIP tape read and write acceleration.	
8	Support for virtual Inter-Switch Link (ISL) connections should be supported on the 2 Gigabit Ethernet port through tunneling	
9	Should support Virtual SAN / Virtual Fabric and should support inter VSAN/Fabric routing	
10	Should support QoS which Can be used to manage bandwidth and control latency, to prioritize critical traffic.	
11	Diagnostic and Troubleshooting tools	

12	Online diagnostics, Fabric Analyzer, Online system health, Port-level statistics, Real-Time Protocol (RTP) debug	
13	Dual power supply should be provided from day one	

5 NETWORK BANDWIDTH

The successful bidder has to provide end to end connectivity from all field cameras to Control room. The connectivity should be wired / optical fiber connectivity. The cable has to be laid by the bidder preferably underground in conduit. The bidder shall contact the Bhopal police on specified date to visit the site, view the locations of cameras to be installed and assess network / UPS cabling plan before bidding. The Network Plan shall be submitted by the successful bidder to the Bhopal Police.

1) The bandwidth from cameras to Control room connectivity should be of minimum 500 Mbps from day one & capable to scalable up to 1GBps as and when required.
2) The TTL should be always less than or equal to 10ms from field cameras to Control room.

Item	Description	Complied (Yes/No)
Media	Must be on fiber/Ethernet or wireless media with the SLA of 99.50% uptime	
Media converters	In case of fiber, the same should be converted to Ethernet media. SLA of 99.50% uptime will be applicable on all accessories in such case	
Redundancy	The will be connected through 50 Mbps ring network with redundant network. There should not be any single point of failure.	
Control room to field camera Reachability	The ping or trace result from Control room to camera should be <10ms or =10ms	
Delay, Jitter, Packet loss	There should not be any delay, jitter & packet drop in the path	
Proactive Monitoring	Vendor should ensure proactive monitoring of the bandwidth and must inform MPP within 5 minutes of any fault detected in the bandwidth. In case of any unusual observations like high or low traffic pattern bandwidth usage compared to routine bandwidth usage, packet loss, etc.; then it must be brought to the notice of concern person at customer end.	
Reports	Weekly reports should be submitted towards 99.50% uptime of bandwidth on the first day of each week.	

6 CAMERA POLES/TOWERS

Camera poles should be used as and when required. The bidder based on site survey will be at a liberty to decide type of Pole/Tower to be erected at the site keeping Industry leading practice in mind.

Sr. No.	Parameter	Minimum Specifications	Complied (Yes/No)
1	Pole Type	Hot Dip Galvanized after fabrication with silver coating of 86 micron as per IS:2629; Fabrication in accordance with IS-2713(1980)	
2	Height	6 meter or higher, as per requirements for different types of cameras & Site conditions	
3	Pole Diameter	Minimum 10 cm diameter pole(Bidder to choose larger diameter for higher height)	
4	Bottom base plate	Minimum base plate of size; 300MM x 300MM x 15 MM	
5	Mounting facilities	To mount CCTV cameras, switch, etc.	
6	Foundation	Casting of civil foundation with foundation bolts, to ensure vibration free erection (basic aim is to ensure that video feed quality is not impacted due to winds in different climatic conditions and also from vibration caused due to heavy vehicles on road). Expected foundation depth of min. 100 cms	
7	Protection	Lightning arrestors with proper grounding	
8	Sign-Board and Number Plate	A sign board describing words such as “this area is under surveillance” and with serial number of the pole	

Note: Pole shall be capable of mounting the weather proof IP rated enclosure which houses the switch, router, power supply/UPS etc…

7 STORAGE

S.N.	Feature	Required Product Specifications	Complied (Yes/No)
1	High Availability & Scale-Out Architecture	▪ No Single Point of Failure, self-healing design protects against disk or node failure including storage backend failover. ▪ Truly distributed, clustered architecture that combines modular storage nodes with Storage systems and management software.	
2	Scalability and Storage Operating System	▪ The same storage system should scalable up to 4 times of current usable disk space Storage file system which is fully distributed, The OS should be Real time optimized storage OS. It should not be general purpose OS	
3	Host Connectivity, Protocol & host OS support	▪ The offered Storage shall be supplied with at least 16nos of 10G IP Ports across multiple Controllers for Host Connectivity. There should be enough room for expansion for the same. ▪ The Storage System should support all necessary protocols which will be used in this project along with SNMP LDAP SMB1, SMB2, NFSv3, NFSv4, SNMP, LDAP, ADS, NIS, HTTP, FTP, Hadoop. ▪ Should support all latest version of Windows, Linux, UNIX	
4	Total Aggregate Storage Bandwidth	▪ The Proposed storage system should ensure a minimum total aggregate bandwidth of 10000Mbps on a 90% write & 10% read application environment. ▪ Storage OEM should provide certification for the same.	
5	Storage Controller Processor & Cache	▪ Every controller should have the Latest Intel Quad Core Processor or equivalent. ▪ 24GB Cache per controller and the overall Storage system should have 130GB of cache with further scope to scale.	
6	Storage Capacity Requirements with Disk Protection	The Proposed Storage Array should be configured with Minimum 120 TB Usable Capacity using minimum 7200 rpm speed or better Drives protected by Double disk failure or RAID6 or equivalent. The usable capacity is defined as the Net storage capacity available for the application stack, after deducting the penalties imposed by storage infrastructure requirements, disk and array formatting, RAID penalties, host OS and file system formatting including overheads or any other penalties which eat away usable disk space. Drives offered for the above capacity can be of the Highest Capacity offered by the Vendor. The same Storage System should support 4 times extra growth in terms of performance and capacity for future	

		expansion.	
7	Storage Management Software	Web-accessible Configuration and Management with online upgrades.	

Note: The storage capacity mentioned in table above is a tentative figure for specified number of cameras 80, assuming recording for 30 days (24 X 7). The bidder may suggest changes in calculation of storage based on the technical specification of camera equipment proposed in this tender.

8 VIDEO MANAGEMENT SOFTWARE

Scalability: The proposed video management system shall be able to support up to 1000 CCTV Camera at to accommodate any future expansion System shall support viewing of video from multiple locations and by multiple users.

Auto-Merge Recording: The CCTV camera shall support local storage. In the event of the camera loosing connectivity with the central servers, the camera shall automatically start recording on the local storage. Once the connectivity with the central server is restored, these local recordings shall be automatically merged with the server based recordings. Thus it will offer the operator continuous recording. All this functionality shall be automatically managed by the camera and the video management system.

Virtualization: The proposed Video management system shall support running of the recording, management and database servers in a virtualized environment, thus lowering the requirement of physical servers.

Redundancy: One Redundant recording server shall be provided for. Each recording server shall be limited to a maximum of 200 Mb traffic and shall provide sufficient spare capacity. These servers shall not be overloaded. The system shall support automatic failover for recording servers. The allocation of Cameras to recording servers shall be done automatically by the VMS.

In future, Proposed system shall provide seamless integration capabilities with Automatic Number Plate recognition system, Emergency communication system. As the requirement of camera specifies Audio Inputs and Outputs on the camera, it shall be possible to have 2 way communications from the location of the camera to the central viewing / monitoring station.

The video management system shall be able to trace the path of video traffic from camera to the servers with additional information providing probable bottlenecks, network issues and other transport problems affecting the transmission of video from camera to server.

The software OEM should have its own development Centre in India.

The VMS & the IP cameras should be from single OEM or the VMS OEM should certify the IP cameras proposed.

VMS shall support video streams up to at least 15 Frames per Second

Sr.No	Specifications	Complied (Yes/No)
1.	**The system should be easy to install, learn, operate and manage:** The VMS must have rich user interface that provides one-click access, dragdrop, context menu, shortcut keys, customizable GUI etc. to enhance operational efficiently in daily tasks and maintain The VMS shall have ability to respond fast & shall be applicable to all processes, functions, features, and screens of a video management system.	
2.	Simple, clear documentation including User Guides (how to use the product) and Technical Reference Manuals (quick reference on functions and procedures) shall be submitted	

3.	**Scalability:** The VMS shall have ability to connect and integrate other technologies and third party software systems (e.g. ANPR, RLVD) in future and act as a cohesive platform for entire surveillance and security system. The system should be able to bi-directionally and dynamically exchange data between various software applications in real-time as well as schedule transfer. The Software shall be scalable upto 10 times minimum. Support for unlimited cameras, servers, sites and clients. Support for storage expandability. **Well documented Software Development Kit (SDK):** The SDK should include a rich, easy-to-use Application Programming Interface (API) that supports the most common programming languages. **Input and output support:** The VMS shall have ability to receive and accumulate inputs from external hardware/software and respond and activate outputs based on the predefined rules. **Event management:** The VMS shall have ability to enforce custom settings for event detection, alarm notification, recording, input/out (I/O) control, and other features in response to events. The alarm management module shall support graphical displays with interactive icons to display the status of the cameras & other inputs. **Support for standard protocols**: The VMS shall have ability to maintain independence from any one vendor & shall support open standard protocol i.e. ONVIF	
4.	Smooth software upgrade path for support of new devices, drivers and operating systems. System should be able to implement software upgrades without requiring all hardware components to be reconfigured. System should provide Database Server Redundancy options, Camera Server Redundancy options, and automatic fault tolerance for robust system uptime and Distributed database and video storage. The system should be able to define critical cameras and provision to record critical cameras over others.	
5.	On screen help and instructions: The system should provide context-sensitive help and active assistance based on the module / screen / operations a user is trying view or perform. As the user moves around the interface, the help should automatically changes to the relevant field-level help topic.	
6.	User management with user groups, roles, privileges and access policies (assigned views, PTZ priority, and access to video wall etc.)	
9.	Recording Server : • The System shall not restrict the number of recording servers • Shall support dual streaming • Shall allow each stream to be viewed independently by client viewer. • Recording from connected cameras shall be stored in individual databases. • Shall support multiple storage formats • Shall support recording in all resolution at desired FPS • Shall support audio recording	
10.	The VMS shall have ability to push a single command or configuration to multiple users with a single “Click”. This can be done though a GUI where access privileges and other parameters can be applied to multiple users or user-groups.	
12.	Configurable data aging mechanism to automatically compress older recordings in lower frame rates to enhance storage.	

	Customizable recording retention period for specific camera, group, area etc.	
14.	Remote Users : Should support at least 10 remote users via network/web browser/client software	
15.	Automatic check & update of hardware drivers & firmware free of cost	
16.	The VMS shall support Electronic Image Stabilization feature	
19.	The VMS shall have ability to easily install, configure, modify, search and remove surveillance devices with automatic discovery of IP devices.	
20.	Advanced option to install other devices like Analog cameras, encoders, microphone-speakers.	
21.	The VMS shall have ability to logically group devices based on installation location, device type, configuration type or any other predefined rules. Individual cameras/devices should inherited rules from parent group/subgroup.	
22.	The VMS shall have ability to search and view device(s) based on standard criteria like ID, Name, Location, Group, Type etc.	
23.	The VMS shall have ability to enforce access privileges (View /Add /Edit/ Remove) to device(s) or group(s).	
24.	The VMS shall have ability to draw and configure e-map of surveillance facility, choose back-ground images, User-definable symbols (for deployed devices)and programmable functions, e.g. hyperlinks, controlling video feed, initialing alarms etc.	
25.	Remote firmware updates notifications and wizard driven installation.	
26.	Provision for primary and backup storage settings for individual camera feeds.	
27.	The VMS shall have ability to configure multiple streams with different quality parameters e.g. Codec (H.264, MPEG, JEPG) , resolution, frame & bit rate etc.	
28.	Support for full duplex audio	
29	a) The VMS shall have ability to create and assign pre-configured views/layouts for monitoring including features like: b) Linking dynamic Webpages, images, maps a view, c) Sharing a view between users, d) Special views for widescreen monitors, e) Updating a view only on motion detection, f) Rotating live video from a pool of cameras, g) Assigning different quality attributes on-the-fly, based on operator's actions. E.g. different quality settings for selected and non-selected video feeds/tiles/panes. h) Granting or revoking permission to use the view etc.	
31.	Basic recording options [Full, Scheduled recoding , Motion detection recording, external/internal hardware or software events / trigger based recording]	
32.	Advanced recordings options [Video only, Audio only, Video plus Audio, Retention rules, Archive/back-up rules, and storage limits etc.]	
33.	The VMS shall have ability to configure, store and track both pre- and post-event recordings. The pre-post event time should be configurable.	
34.	PTZ configuration including presets, patterns, patrolling, masking, priority and permissions.	

35.	The VMS shall have ability to support operations from Web client, Windows Client, and Mobile devices etc. Popup display on the screen in case of any event/alarm/threshold etc.	
37.	Multiple monitor support: The system should allow connecting multiple monitors on single client workstation (loaded with suitable graphics card) and display different contents on each of the connected monitor.	
38.	All panes / tiles should indicate mode (live or recoded), source (camera name/location) and date/time and applied quality information (FPS, CODEC). The font color shall be changed automatically in sync with the video/image to have a clear text reading at any point of time. A matrix view should support minimum 2x2, 3x3, 4x4…9x9 formats and any number of multiple screen divisions.	
39.	PTZ controls: When PTZ is deployed and enabled, system should offer a separate control panel for PTZ operations. The control panel should include list of presets, patterns, tours, eight directional & home positions and zoom-in & zoom-out buttons. A dedicated joystick can also be used for PTZ operations.	
40.	PC keyboard shortcut keys: Along with menu-driven interface, a VMS should also support custom shortcut keys to helps operators quickly switch between different modules/screens, change views or panes/tiles and to carry out playback functions.	
41.	Snapshots: System should allow creating a still image from live or recorded feed and storing it into a workstation.	
43.	The VMS shall have ability to boost video quality manually (by operators) or automatically as configured on event trigger or as scheduled.	
44.	Instant replay facility with configurable replay-duration.	
45.	The VMS shall have ability to bookmark / add-to-favorites in both live and playback modes. Bookmarks should be user specific and managed (create, share with other users, search, remove, add comment) by the owner.	
46.	Digital zoom to enlarge portion of an image to provide superior zooming capability.	
47.	The VMS shall have ability to Start/Stop Recording on demand (manually)	
48.	Option to view surrounding cameras: The system should enable operators to select master camera feed and based on group/subgroup details, its surrounding cameras should be automatically displayed on separate panes. These panes/tiles should be dynamically generated so that operator does not need to manually pull the feeds from desired cameras.	
49.	Evidence export feature: The system should allow users to export audio/video evidences in open format for internal investigation or to share authentic proof to public authorities and outside agencies. Alternatively the bidder may provide the required player/software to run the exported video file if the VMS not support to export in avi or other standard format. The system should offer options to enable watermarking camera name & timestamp and also encrypt or apply password protection to the exported clips.	

50.	The VMS shall have ability to quickly search and retrieve recordings: Search methods should include search by camera(s), group, date/time, alarm/event / bookmark list, smart (motion) search by creating motion index or by generating thumbnail summary of a video archive to locate specific event. The search result should provide an intuitive timeline browser that represents the overall length of the recording. It should underscore recoded event (motion based, scheduled, event based or normal) and allow users to quickly jump back and forth to a location in selected recording. Smart (motion) Search: The feature should enable users to select area of interest on any given view of camera recording, and search for motion incidents within that area	
51.	The VMS should have onscreen process guidance/help menu & instruction	
52.	The system should offer following playback controls • Play/Pause • Lock speed • Forward playback (1x, 2x, 4x, 10x, 20x, 40x,… • Reverse playback (-1x, -2x, -4x, -10x, -20x,-40x, ….. • Slow forward playback (frame by frame, 1/8x, 1/4x,1/3x, 1/2x, 1x) • Slow reverse playback	
53.	Video Lock: The system should allow users to lock the relevant portion of video recording related to any event to avoid the deletion of the important incidence from the system before its retained/backed-up.	
54.	Evidence Printing: Option to create and print a small surveillance report that includes image(s) and comments about recorded incident.	
55.	The system should enable users to send/transfer a view to preconfigured displays.	
56.	The system should offer options to set Hue, Saturation, Brightness, Contrast, Sharpness etc.	
57.	The system should have in-built, configurable, basic motion detection analytic engine that efficiently • Detects motion • Virtual line • Auto tracking	
58	The system should have in-built event/alarm management module that allows generating, distributing, storing, tracking and reporting of incidents and events as they occur. The module should have The VMS shall have ability to: • Define and configure events that can be triggered by motion detection analytics, video loss, audio detection, active tampering, temperature, connected external devices or by manually activating the same. • Configure automatic/programmed responses based on priority and escalation level for specific event(s). • Search and view list of triggered events based on source, priority, event type, date/time, keyword etc.	

59.	The system should provide interactive reporting interface with standard and user-defined custom reports and filtering options to: • Monitor real-time and history of overall operational health of a surveillance system or individual components (recordings, cameras, servers, storages, CPU, memory, bandwidth etc.). • Review currently logged in users and functions being performed. • Retrieve audit trails - user activities, errors and system logs. • View list of hardware units and selected configuration options. • List down configured users and corresponding roles & permissions. • View details of bookmarks, event/alarm history and exported evidences	
60.	The system should have Inbuilt diagnostic utility that constantly monitors several different functions of deployed hardware and software modules and attempts to correct the problem in case of deviations from the established baselines occurs.	
61.	The facility should be there to extract & save the video footages / images on CD, DVD, USB, External Storage etc.	

9 DESKTOP

S .No.	Particulars	Specifications	Compliance (Yes/ No)
1	Processor	Minimum 4 core processor with minimum 3.0 GHZ Minimum 6MB of L2/L3 Cache.	
2	Chipset	AMD 780V /Intel Q33 or better	
3	Memory	2x2GB Dual Channel DDRII SDRAM 800 MHz or higher expandable to 8 GB	
4	Hard Disk	1 TB SATA II HDD 3Gbits/s with NCQ & 7200 RPM	
5	Slots	Minimum 1 PCI slots and one PCI Express x16 bus slot	
6	Motherboard	Motherboard shell be of Micro ATX / smaller form factor	
7	Graphics	Integrated graphics controller Should be able to support 3 monitors	
8	Audio	Integrated audio controller (Intel high definition or equivalent)	
9	Ethernet	Integrated PCI 10/100/1000 Mbps Ethernet controller with full duplex & WOL support	
10	Ports	• Integrated Two port SATA 3.0 Gbits/s controller • 1x fast serial port, minimum 4 x USB 2.0 ports (2 ports on front) • 1xKeyboard port • 1xMouse port • 1xR45 port	
11	Optical Drive	16X or Higher Speed DVD-ROM drive	
12	Chassis	Slim Chassis (Small form factor) with enough cooling fans, one free internal peripheral bay and	
13	Power Supply	240W Micro ATX / SFF Power Supply.	
14	Keyboard & Mouse	• 104 keys OEM Keyboard with bilingual support & Key Skin Cove • OEM Optical Scroll Mouse with Mouse pad	
15	Display	• 21” TFT LCD Flat Monitor with 8 ms or better response time, TCO ‘99/03 compliant • 29” TFT LCD Flat Monitor with 8 ms or better response time, TCO ‘99/03 compliant for Supervisor one per location. • Should support upto 3 monitors connected to one CPU	
16	Others	• Power management features & Desktop Management Interface (DMI) implementation • System user manual and all other necessary accessories	
17	OS/Software Support	• Preloaded OS Software: Windows 7 or Windows 8 or better	

10 USB JOYSTICK

S .No.	Particulars	Specifications	Compliance (Yes/ No)
1	Basic Design	The joystick shall be USB with Hall Effect specifically designed to provide the network video controlling with responsive and accurate pan/tilt/zoom camera positioning controls.	
2	Device Support	The device shall support the camera makes mentioned in the RFP	
3	Software Support	Can be integrated seamlessly with any video surveillance software platform recognizing joystick inputs via Microsoft's DirectX.	
4	Switches and ports	Six programmable switches and USB Port	
5	Storage Temperature	0° to 50°C	
6	Humidity	0 to 85%	
7	Compliance	RoHS Compliance	
8	Power Supply required	+5VD	

11 SERVER

Processor	2 processors of Intel Xeon Processor E5 V2 family or above
Minimum Number of Cores	10
Minimum Clock Speed:	2.80 Ghz
Minimum L3 Cache:	15 MB
Memory	Each server should be configured with 64 GB of memory The server should have at least 24 DIMM slots and a maximum scalability of up to 700 GB
Disk Controller	Integrated SAS Controllers
Hard Disk Drive:	The server should support a minimum of 2 hot plug SAS, SATA and SSD hard disk drives & be supplied with 4.0 TB through hot swap SATA / SAS HDD
Network Interface:	Minimum 4 x 1 GB
DVD Writer	SATA DVD-ROM - R/W or DVD ROM.
External Interface	The server should provide a minimum of 2 x 10Gb ports for Ethernet and 2 x 8 Gb ports for FC. Or The server should provide minimum 4 x 10Gb CNA (Converged Network Adaptor) ports.
Disk Bays:	Minimum 5 hot-swap SAS HDD
Power Supply	94% or more efficient 2 nos Hot Plug Redundant power supplies must sustain full load .
Fans	Hot-plug fans, at least 1+1 redundancy
Graphics Controller	Integrated Graphic Controller with external VGA port and minimum 16MB Video RAM and 1280x1 024 resolution
OS Environment	Suitable server license for VMS application handling 80 Cameras
Products	The server must be compliant with following international standards: PCIE 3.0 Compliant, Microsoft® Logo certifications, ACPI 2.0. Compliant, UL/FCC certified
RDBMS	Suitable RDBMS for VMS application - Oraclel10g/11g/SQL-2012 or equivalent 80 clients.
Licensing	Should include all necessary licenses for management for a fully loaded server having 80 clients
Form Factor & accessories	Rack with Cable Arm Guard, Power Distribution Unit and all mounting and equipment Inbuilt / integrated / installed with KVM switch and appropriate TFT Digital Color Monitor TCO certified, USB Keyboard & mouse to Monitor all the Servers. KVM should be compatible with all OS, should have On-Screen Configuration and Activity Reporting displays system-related

	information on the console monitor, such as selected server name, status, power-up test data and configuration menus.
Gartner report	Server Should be in the in the list of top 5 server brands as per Gartner report published for India/Asia Pacific/World in the year 2013

12 WORKSTATION

The Successful bidder has to provide furniture for the control room workstations, sitting arrangement & other requirement as per industry standards. Sample has to be approved by the purchaser. The bidder has to ensure industry leading practices are kept in mind ensuring aesthetics of the room.

13 LED DISPLAY UNIT 55”

Resolution	1920 x 1080 pixels, Full HD or higher
Size	55 inch or bigger
Light Source	LED
Response Time	8 ms
Viewing Angle	H : 178°, V : 178°
Video	NTSC, PAL, SECAM
	480i, 480p, 720p, 1080i, 1080p or better
Standard Inputs	1x Digital DVI-I ; 1x Digital DVI-D ; 1x CVBS BNC ; 1x Component Video BNC ; 1x BNC (RGBHV or YPbPr)
Standard Outputs	1x Digital DVI-D ; 1x CVBS BNC
Control	Network port (RJ45, 10BASE-T/100BASE-TX) RS-232C (D-sub 9-pin, straight)
Input Voltage	AC 90~240V@50/60 Hz
Power Consumption	< 160W
Standby Mode	< 2W at 110V
Temperature	0°C - 35°C (32°F - 95°F)
Operating Life	> 50,000 hours
Combined Bezel (Typical)	Upto 6.0 mm
Power Supply	(1 + 1) Redundant AC-DC high-efficiency power supply w/ PFC
	AC Voltage 100 - 240V, 50-60Hz
Resolution output support	1920x1200 per output minimum
The Display unit should be capable of 24 x 7 operations without degradation in performance.	
Comprehensive 3 Years onsite warranty	

14 UPS

14.1 UPS REQUIREMENTS & FEATURES

UPS System design concept is based on redundancy and availability with true online system. To support the dual bus system configuration four units of UPS should be installed. Dual redundant UPS systems will take care of following needs – Servers, video wall, Storage, Workstations and cameras. Cabling needs to be done from the UPS to all respective cameras. This will be redundant to power through POE switch

The solution should be automatic with power supply from the transformer as the primary source and automatic switchover to DG set as a secondary source for the control room. Earthing should be provided from the electrical room control panel to the Earthing pits.

Description	Specification	Complied (Yes/No)
14.2 GENERAL SPECIFICATIONS		
UPS Topology	On line double conversion VFI SS 111	
Architecture of the UPS	Modular, Scalable, redundant based on 6.7kVA Power Modules	
In/Out phase Configuration	Three phase	
Neutral	Neutral Passing through	
Output wave form on mains run	Sinusoidal	
Output wave form on battery run	Sinusoidal	
Bypass type	Static and electro mechanic	
Transfer time	Zero	
14.3 INPUT		
Nominal Voltage	400 V three phase / 230V single phase	
Voltage range	-20% +15%	
Frequency	50 Hz o 60Hz (autosensing)	
$THDi_{in}$	< 3% al 100% of nominal load	
Power Factor	> 0.99 from 50% to 100% of nominal load	
14.4 OUTPUT WITH MAINS (AC-AC)		
Nominal voltage	400 V three phase	
Nominal power	20 - 120kVA	
Active power	18 - 108kW	
Voltage variation (static)	± 1%	

Voltage variation (dynamic 0-100%; 100-0%)	± 1%	
THDv on nominal power (linear load)	< 0,5 %	
THDv on nominal power (not linear load P.F.=0,7)	< 1 %	
Frequency	50 Hz o 60 Hz (autosensing or selectable)	
Frequency tolerance	Synchronized with input frequency or ± 1% free run	
Current Crest Factor	3:1 accordingly with IEC EN62040-3	
Overload capability: 10 min 60 sec	 125% load rate with no bypass intervention 150% load rate with no bypass intervention	

14.5 OUTPUT IN BATTERY RUN (DC-AC)

Nominal voltage	400 V three phase	
Nominal power	20 - 120kVA	
Active power	18 - 108kW	
Voltage variation (static)	± 1%	
Voltage variation (dynamic 0-100%; 100-0%)	± 1%	
THDv on nominal power (linear load)	< 0,5 %	
THDv on nominal power (not linear load P.F.=0,7)	< 1 %	
Frequency	50 Hz o 60 Hz (autosensing or selectable)	
Frequency tolerance	± 1% free run	
Current Crest Factor	3:1 accordingly with IEC EN62 040-3	
Overload capability: 2 min 30 sec	 125% load rate with no bypass intervention 150% load rate with no bypass intervention	

14.6 BATTERY

Type	Lead Acid, sealed, free maintenance VRLA	
Nominal UPS Battery Voltage	252 Volt DC	

Battery charger type	PWM hi efficiency, one in each power module	
Charging Cycle	Intelligent with boost charge and advanced management	
Max Charging Current	2,5Aeachpower module	

14.7 ENVIRONMENTAL SPECS

Noise level @ 1m	50÷65 dBA	
Working temperature range	from 0°C to +40°C	
Stock temperature range	from -20°C to +50°C (excluded batteries)	
Humidity range	20-80% not condensing	
Protection degree	IP21	

14.8 MECHANICAL AND MISCELLANEOUS

Net Weight without batteries[1]	364 kg	
Dimensions (W×H×D)[2]	1 x (570 x 2080 x 912) (mm)	
Colour	RAL 7016	
Technology rectifier/booster/inverter	MOSFET/IGBT	
Communication Interface	2 serial port RS232, 1 logic level port, 5Dry contacts port	
Input/output connections	3P + N + PE Connectors on omega bar	
Installed Power Modules	6.7kVA	
Standards	EN/IEC 62040-1, EN/IEC62040-2, EN/IEC 62040-3	

The UPS Manufacturer Company must have CE/ ISO9001 certification for development, production, and services.

Signal referencing copper Earthing to be used using braided copper wire of 6 Gauge inside the Control room. The weight depends on the number of the installed batteries accordingly with the required autonomy. The battery cabinet dimension can change depending battery set accordingly with the required autonomy.

15 UPS FOR FIELD EQUIPMENT (IF REQUIRED)

Bidder should provide 1 KVA UPS for Field equipment power backup (if power from centralized UPS is not feasible) of at least 4 Hrs.

PARAMETER	SPECIFICATIONS	Complied (Yes/No)
Capacity	4200 Watts / 6000 VA or better	
Technology	SPWM, IGBT/MOSFET (for more than 72 DC volt IGBT preferred)	
Input voltage	230V AC, Single Phase, 3 wire	
Input Voltage Range	176V AC to 282V AC	
Input Frequency Range	47 /63 Hz +/- 3 Hz (auto sensing)	
Input Over Voltage Protection	280V AC	
Input Under Voltage Protection	155V AC	
Over Voltage cut off	Should be offered externally	
Output voltage	230V AC Single phase ±1%	
Frequency	50 Hz ± 1%	
Lead power factor	0.7 Lag to Unity	
Output Over Voltage Protection	245V AC Single Phase	
Output Under Voltage Protection	210V AC Single Phase	
Over load capacity	125% of rated load for 60 sec	
Total Harmonic Distortion	Less than 3%	
Short circuit protection	Soft Shut down should occur without blowing any fuse	
Crest Factor	up to 2 : 1	
Over Temperature	Indication Required	
Load on Battery	Indication Required	
Battery on Charge	Indication Required	
Battery low	Indication Required	
Mains on	Indication Required	
DC on	Indication Required	
Inverter on	Indication Required	
Inverter Tripped 1. Output Over Voltage. 2. Output Low 3. Over Load System	Indication Required	
	Indication Required	
	Indication Required	
Static Switch	Automatic Bi-directional should take care of 100% uninterrupted transfer of load from UPS	
Transfer Time	<4 m sec	
Overall Efficiency	>85%	
Inverter Efficiency	>90%	
Metering	Separate/Single Digital Meter	
DC Voltage	Display Required	
DC Current Charge/discharge	Display Required	
Output Voltage	Display Required	
Output Current	Display Required	
Input Voltage	Display Required	

Digital three/three & half freq. Meter (for Both input & output)	Display Required	
Battery	Maintenance-free sealed Lead-Acid battery with suspended electrolyte : leak proof	
Period of Backup	1 Hr. with 100% Load	
DC Bus Ripple	<1%	
Total DC Bus Voltage	As per requirement	
No. of Battery Banks	Single	
No. of Battery	As per requirement of 4 hrs. battery backup	
VAH Rating	As per requirement	
Battery Housing	Closed housing with lock	
Audible Alarm for Following Conditions		
Battery Low Audible	alarm Required	
Mains Failure Audible	alarm Required	
Inverter Under-voltage Audible	alarm Required	
Inverter Over Voltage Audible	alarm Required	
Over Temperature Audible	alarm Required	
Inverter Overload Audible	alarm Required	
SNMP	Enabled	
Environmental		
Operating Temperature	0 - 50 °C	
Humidity	0 - 95% (non-condensing)	
Noise Level	<50 dB at full Load from 1 Mtr distance	

16 MULTIFUNCTIONAL PRINTER

Printing Technology:	Laser Monochrome
Format:	A4
Printing Speed:	A4 / Letter – minimum 40 ppm
Printing Resolution (dpi):	600 x 600 dpi (1200 x 1200dpi equivalent)
First Page (sec):	A4 / Letter - 8.6 sec
Memory (MB):	Minimum 512MB
Paper Feeding:	600 (Standard – 500 + Multipurpose Tray – 100)
Interface:	USB 2.0
Network:	10Base-T / 100Base-TX / 1000Base-T
Duplex:	Standard (only A4 / LTR / LGL / 8.5"×13")
Size (W x D x H mm):	454 x 424 x 345 mm
Power Printing (W):	Approx. 660 W
Others:	5 Line LCD Operation Panel
Power Stand-by (W):	15 W
Noise Level	54.5 dB or less
Maxim Volume (page):	100000 pages